what unstable, but arrangements have been made by which it is hoped that the records may be continued. A slight movement of the observatory towards Chamounix was noted, but it is expected that future displacements will be insignificant; and, in any case, the means are at hand to restore it to its original position. The practicability of the establishment of observatories on snow-clad mountains is therefore no longer to be questioned, and the multiplication of such institutions as that on Mont Blanc will no doubt contribute largely to our knowledge both in meteorology and astronomy.

It is characteristic of Dr. Janssen that he should take advantage of the opportunity of observing the aqueous bands in the solar spectrum. The air above him being very rare and also extremely dry, he found that when observing sunlight in its totality the bands at C and D were absolutely invisible, while the group at *a* was so pale that its presence could scarcely be determined. Dr. Janssen already regards it as certain that there is neither oxygen nor aqueous vapour in the solar envelopes, but the question is so important that too many observations cannot be made. To carry the observations a step further, it will be necessary, under analogous atmospheric conditions, to compare very carefully the centre of the sun's disc with the edge, to see if there is any augmentation of the *a* group as the limb is approached, this group being especially sensitive to variations in the amount of absorbing vapour.

EPHEMERIS FOR FAYE'S COMET.—The following ephemeris, for Berlin midnight, is given by F. Engström in *Astr. Nach.* No. 3313:—

	R. A.			Decl.	
	h.	m.	s.	°	′
Oct. 17	21	11	9	−4	20·6
19		12	10		31·7
21		13	18		42·1
23		14	32		51·9
25		15	54	5	1·0
27		17	23		9·5
29		18	59		17·3
31		20	42		24·5
Nov. 2		22	32		31·0
4		24	28		36·7
6		26	30		41·6
8		28	38		45·8
10		30	52		49·3
12		33	13		52·2
14	21	35	39	−5	54·4

The calculated brightness is practically constant throughout the above period. Perihelion passage will not occur until March 19, 1896.

VISIBILITY OF THE DARK SIDE OF VENUS.—Various theories have been advanced at different times to account for the visibility of the hemisphere of Venus which is not illuminated by the sun, but there is no general agreement as to which is the most probable. Still another explanation is offered by M. Camille Flammarion, and it has the merit of being based on careful observations made at Juvisy during August and September of the present year (*Bull. Soc. Ast. de France*, October). The planet was frequently observed in full sunshine by M. Flammarion and his assistants, and the observations appear to put the matter in quite a new light. To these observers it has several times seemed that the interior of the crescent of Venus was darker than the sky, even on the day of inferior conjunction. That this appearance was not simply an effect of contrast produced by the luminous crescent is shown by the fact that no such darkening was apparent at the exterior edge of the crescent, and again by the visibility of the obscure hemisphere when the luminous part was artificially eclipsed. The colour of the unilluminated area was slightly violet in all the varied conditions of observation. M. Flammarion considers that the observations can be best accounted for by supposing that Venus is projected on a somewhat lighter background, such as might be furnished by the zodiacal light, or an extended solar atmosphere. The violet tint which was noted may have been due to the considerable refraction of the sun's rays by the atmosphere of the planet, the reddish tinge thus produced on the planet appearing purple when seen through our own blue sky.

In the same article, M. Flammarion gives some interesting facts relating to the history of the phenomenon, and some calculations which indicate that "earth-shine" is insufficient to account for it. Under the most favourable conditions, the terrestrial light received by Venus is 12,000 times feebler than that received by the moon, and 822 times less intense than the light we receive from the full moon.

THE MELBOURNE OBSERVATORY.—The twenty-ninth report of the Government Astronomer, Mr. R. L. J. Ellery, on the work of the Melbourne Observatory during the year ending at the beginning of last June, has just come to hand. Meridian observations, the daily photography of the sun, magnetic and meteorological observations, have been carried on as heretofore. The number of plates secured, in connection with the photographic chart and catalogue, up to June 1, was 1080. Preliminary measures have been made of 238 plates to obtain the positions where possible, of five stars on each plate, to be used for the determination of the constants of the plates. Mr. Ellery refers to the important change in time-reckoning made in February last by the introduction of zone or standard time in all the Australian colonies. By the zone system, Eastern Australian time, which covers Queensland, New South Wales, Victoria, and Tasmania, conforms to that of the 150th meridian; and this makes Melbourne exactly ten hours in advance of Greenwich time, instead of 9h. 30m. 54s., which is the true difference of longitude. The retirement of Mr. Ellery from his post as Government Astronomer has already been noted in these columns. Mr. Ellery has built up the Melbourne Observatory from its very small beginning in 1853 to its present recognised position among the national observatories of the world; and we are glad to see that the Government has appointed him a member of the Board of Visitors, so that he has not entirely severed his connection with the observatory. He has been succeeded in the directorship by the chief assistant, Mr. P. Baracchi, whose pendulum observations are well known to students of terrestrial physics.

A NEW OBSERVATORY.—The New York *Nation* notes a new departure at the University of Pennsylvania, by the addition of an astronomical observatory. The observatory has already been commenced, and, when completed, it is designed to furnish better facilities, not only for instruction, but for original research as well. The new edifice is two miles from the limits of Philadelphia, and about five miles from the university buildings. The instruments are an eighteen-inch equatorial, with spectroscope attachment, by Brashear, and a meridian circle and zenith telescope, each of four inches aperture, also by Brashear. The mountings are by Warner and Swasey. This institution will be known as the Flower Observatory, and its director is Prof. C. L. Doolittle, formerly of the Lehigh University.

THE INTERNATIONAL CONGRESS OF PHYSIOLOGISTS AT BERN.[1]

II.

THURSDAY morning, September 12.—Presidents: Profs. Dastre and Wedensky. Prof. Arloing (Lyons) gave the result of his researches on the persistence of electric irritability in the peripheral ends of divided nerves. The author found that the length of time for which electric irritability was retained varied with the species of animal, and also with the individual, and further that it was different both for different nerves and for the different kinds of fibres in compound nerves, such as the vagus. For spinal nerves the irritability lasted from four to five days in dogs, and from eight to ten days in horses. In one ass the author obtained cardiac inhibition with a rise of blood pressure, upon stimulating the peripheral end of the vagus fifty-seven days after section; this result he attributed to a tetanus of the myocardium.

Dr. Arthus (Paris) defended the view that the salts of calcium are necessary to the coagulation of the blood, against that of Alex. Schmidt, who does not believe their *rôle* to be an essential one. He further discussed the action of neutral solutions of the oxalates, fluorides, &c., in rendering the blood incoagulable. He disagreed with Schmidt, who holds that they act specifically, and maintained that their effect is due solely to the fact that they precipitate the calcium salts. Arthus repeated Schmidt's experiments, and was unable to confirm his results.

Prof. v. Kries (Freiburg) discussed the phenomena of colour vision in eyes adapted for darkness.

Prof. Gamgee (Lausanne) gave the result of his researches on the violet and ultra-violet spectrum of hæmoglobin and its derivatives. He exhibited photographs which showed the absorption band between G and H presented by hæmoglobin. In the spectra of reduced hæmoglobin, of CO and NO hæmoglobin, the band was shown to be displaced towards the less refrangible end of the spectrum. This very remarkable and unusual band he showed to be due to the hæmatin moiety of the hæmoglobin molecule, and to be independent of the Fe. Prof. Gamgee described and showed photographs of the spectrum of turacine, a pigment obtained from the feathers of certain birds. This substance, containing 6·9 per cent. of copper, gives a spectrum identical with that of hæmoglobin. A demonstration followed at which the spectra were shown.

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[1] Continued from p. 556.

Prof. Burdon Sanderson (Oxford) gave a demonstration, illustrated by slides, of electrometric photographic curves, and maintained the following propositions.

Proposition A.—There are two kinds of electrical response (Reizschwankung) to excitation of a muscle by its nerve. I. Diminution of the E.M.F. of the previously existing muscle current. II. The excitation wave. The first (I.) is evoked (*a*) when the nerve is stimulated by equal alternating currents of great frequency, (*b*) by the constant current, (*c*) by salt crystals, &c. The second (II.) is evoked in uninjured muscle (*a*) by single electrical and mechanical momentary excitations, (*b*) by rhythmically repeated momentary excitations (true tetanus). I. and II. exist together in rhythmical excitation of injured muscle.

Proposition B.—In the reflex spasm of strychnine each phase of excitation resembles I. The strychnine spasm is not true tetanus.

Dr. Waller (London), gave the results of his researches on the influence of chemical reagents on the electrical excitability of isolated nerve. Excised frogs' nerves were rhythmically excited once a minute during one-eighth of a minute. The current of action was recorded by a galvanograph. The nerve was enclosed in a gas chamber to study the effects of gases, and dipped for one minute in decimolecular solutions for salts, and 1 per cent. solutions for alkaloids. By means of this method Dr. Waller was enabled to study the action of a large number of bodies, the results of which he gave; his researches also extended to the study of physiological antagonism.

Dr. Epstein (Bern) showed that the increase in the acuteness of vision, which occurs under the influence of auditory impressions, can be experimentally demonstrated. The author described his apparatus. He further expressed the opinion that the centre for this process lay not in the cortex, but in the superior corpora quadrigemina. He regarded it as essentially dependent upon a reflex sensibility of the retina, the optic nerve containing the efferent fibres; in favour of this view, he quoted an experiment in which by faradic excitation of the nerve from the cochlea he obtained eye movements, and increased conjunctival reflex.

Thursday Afternoon.—Presidents, Profs. Vitzou and Fredericque. Prof. Rutherford (Edinburgh) gave an account of his researches on the structure and contraction of striped muscular fibre. His observations were mostly made upon crabs' muscles fixed in a 4 per cent. solution of formaldehyde, and then stained with eosin or heliocine. He regards the fibrils as the essential elements of the sarcous substance, each fibril has in its whole length a thin envelope. He regards the fibril as composed of a series of segments—(1) Bowman's element, (2) the intermediate segment placed midway between successive Bowman's elements, and (3) the clear segment placed between (1) and (2). The intermediate segment is tripartite, and consists of Dobie's element, forming a node in its equator, and Flögel's, element (Nebenscheibe) on each side of it. During contraction, the first change consists in the shortening of the interval between the adjacent ends of Bowman's elements. This stage of the contraction probably results from the absorption of fluid by Bowman's elements. In the next stage Bowman's elements shorten owing to a real contraction of their tissue, their chromatin moving to their ends, which become swollen.

Drs. Sherrington and Mott gave the results of their researches on the functions of the posterior roots of the spinal nerves from the fourth cervical to the second dorsal. (*Roy. Soc. Proc.*, vol. liii., 1895.)

Prof. de Burgh Birch (Leeds), read a paper on the equipment of an experimental laboratory. The author has succeeded in obtaining apparatus of sufficient exactitude for physiological research at a very moderate cost. (His mechanician is Abm. Kershaw, Cankerwell Lane, Leeds).

Prof. Rosenthal (Erlangen) showed an apparatus for the quantitative determination of CO_2 in air. The apparatus was constructed for the purpose of practical hygiene.

Dr. Jacquet (Bâsle) gave the results of his researches on the blood in fever. In fever the red blood-cells are diminished; tepid baths but not antipyretics bring the number again to the normal. In artificial fever (rabbits raised to a temperature of 50° C.) the red blood-cells are also greatly diminished in the systemic veins, but are increased in the liver.

Dr. Gley (Paris) discussed the action of the intra-vascular injection of solutions of peptones in rendering the blood incoagulable. He showed that these bodies did not possess this action after the ligature of the lymphatics coming from the liver. From this experiment the author inferred that the substance which renders the blood incoagulable, and is produced in the organism under the influence of the peptones, is secreted by the hepatic cells.

Dr. I. V. Üxhüll (Heidelberg) showed an apparatus for the rapid mechanical stimulation of the nerve of a muscle-nerve preparation.

Dr. Schenk (Wurzburg) read a paper on the innervation of the iris. The author's communication chiefly concerned the observation of Dogel, that upon stimulation of the cervical sympathetic in cats, dogs and rabbits, in addition to the dilatation of the pupil on the same side, a contraction of the pupil on the other side occurred. Schenk regarded this phenomenon as a consensual pupil reflex (consensuelle Pupilla-Reflex). In Dogel's experiments the eye on the same side as the stimulated sympathetic was exposed to the light; hence during stimulation more light entered the pupil, and this caused contraction of the pupil of the opposite side. When the eye on the stimulated side was shaded from the light, the contraction of the other pupil did not take place. This explanation would not hold for rabbits, as in them the consensual pupil reflex is absent; the author was, however, in the case of rabbits, unable to repeat Dogel's results.

Dr. Leathes (London) read a paper on the osmotic changes between the blood and the tissues. The author gave the result of his experiments on the influence of strong solutions of cane-sugar and dextrose, and of iso-, hypo-, and hyper-tonic solutions of NaCl in causing the passage of fluid from the blood into the tissues, or *vice versâ*. The author further discussed the osmotic pressure of the lymph in the thoracic duct, which he found $\frac{1}{100}$ to $\frac{1}{200}$ higher than that of the blood.

Friday Morning, September 13.—Presidents, Profs. Rosenthal and Langley. Prof. Wedensky (St. Petersburg) read a paper on the exciting and inhibitory action of electric tetanisation on the nerve-muscle apparatus. The author showed that, if induced currents of great frequency and intensity be applied to the sciatic nerve, the gastrocnemius contracts strongly but soon relaxes; if at this time the intensity of the exciting currents be diminished until they become moderate, a very strong (optimum) contraction of the muscle takes place. Further, if when the muscle is in a condition of relaxation produced by the application of strong and frequent induced currents to the nerve, one diminishes the frequency, a strong tetanic contraction can be reproduced, which at once disappears upon again increasing the frequency. There is for each stage of tetanisation an optimum of frequency. The relaxation of a muscle, under the application of strong and frequent induced currents to its nerve, is caused by the nerve-endings entering into a condition of inhibition. This can be demonstrated by applying to the muscle moderately strong induced currents; no effect is produced until the strong and frequent tetanisation of the nerve is discontinued.

Dr. Lüscher (Bern) read a paper on the nervous mechanism of swallowing. The author's experiments were made upon rabbits. He showed that the three branches of the recurrent laryngeal overlapped in their distribution to the œsophagus, *i.e.* each branch supplied some of the region supplied by the other. After division of the recurrent laryngeal stimulation of the central end of the superior laryngeal did not produce swallowing. Upon stimulation of the central end of the divided recurrent laryngeal (the nerve of the other side being intact) a faint act of swallowing was produced. Stimulation of the central end of the vagus only gave rise to swallowing when the recurrent laryngeal was intact.

Prof. Bowditch (Boston) showed an apparatus to demonstrate the mechanism of the ankle-joint. By the introduction of a spring balance into the cord representing the gastrocnemius muscle, and the application of a weight, he could determine the relation between power and weight for the action of this muscle.

Dr. Waller (London) read a paper on the photo-electric currents of the retina.

Prof. Hensen (Kiel) gave a demonstration on an acoustic apparatus, the result of which was to show that the view of Helmholtz, that the vowels owe their special quality to overtones produced in the mouth and adjoining cavities, requires modification; this, in the author's opinion, is impossible.

Friday Afternoon.—Presidents, Profs. Richet and Cybulsky. Dr. Sherrington (London) gave a demonstration on eye movements.

Dr. Lanz (Bern) read a paper on the effect of removal of the thyroid, and of thyroid-feeding in normal animals. Among many interesting results, the author found that thyroidectomised hens either lost their power of laying eggs, or laid very small and ill-formed ones. On the other hand, hens fed with thyroids (30 grms. per diem) had their egg-laying power greatly increased. In some animals the author found that the administration of large quantities of thyroid gland caused an arrest of growth.

Dr. Phisalix (Paris) showed that the blood of the salamander rendered animals immune to curare. This immunity in the case of the frog and pigeon lasts several days.

Prof. Mosso (Turin) read a paper on the effect of rarefied air upon man and apes. The author's researches on man were made on Mount Rosa, at a height of 5600 metres. The author showed that at this altitude the respiratory exchange is diminished; his observations were made under conditions of absolute rest, mostly during sleep. In the explanation of these phenomena the author thinks more attention should be paid to the diminution of CO_2. He describes them under the name of Akapnia (καπνος = smoke). Mosso further described an experiment which he made upon a monkey. He subjected this animal to an atmosphere of pure O at a low pressure; he observed under these conditions the phenomena of mountain-sickness (*Bergkrankheit*) even when the pressure of the O exceeded the partial pressure of this gas in the atmosphere under ordinary circumstances. The author concluded that the two main factors which come into play at high altitudes are (1) the diminution of CO_2 in arterial blood; (2) the physical effect of low pressure on the nervous system.

F. W. TUNNICLIFFE.

CORRESPONDING SOCIETIES OF THE BRITISH ASSOCIATION.

THE first meeting of the Conference took place on Thursday, September 12, the second on Tuesday, September 17, at the Co-operative Hall, at 3.30 p.m.

At the first meeting, the Corresponding Societies Committee was represented by Mr. G. J. Symons (Chairman), Prof. R. Meldola, Mr. J. Hopkinson and Mr. T. V. Holmes (Secretary). The Chairman opened the proceedings with an address.

On the conclusion of the address, Mr. T. V. Holmes made a few remarks with regard to the list of papers read before the various Corresponding Societies, and appended to the Report of the Corresponding Societies Committee. He hoped that the Secretaries of the Corresponding Societies, in preparing their lists, would be careful to group papers, which from their titles might belong to either of two Sections, with that to which they had most affinity. It was also most desirable that the names of papers sent in should not turn out to be mere popular lectures, but should contain something original. It had sometimes happened that on wishing to refer to some paper on the list sent in by some Society, in order to ascertain its true character, it could not be found on their shelves at Burlington House. In future no paper could be placed on the list published by the British Association unless it was on their book-shelves.

Captain Elwes (Dorset) laid upon the table a paper on the rainfall in the county of Dorset, which had been compiled by a member of the Dorset Natural History and Antiquarian Field Club, Mr. Eaton. It was a most careful piece of work, and was illustrated by maps and diagrams.

Mr. Hopkinson said that about twenty years ago he began to note the rainfall of Hertfordshire with about twenty observers. Last year the record he published contained the monthly returns from forty observers. He trusted that delegates would preserve any early meteorological records they might find.

Mr. De Rance remarked that the increasing usefulness of local societies was shown by the fact that two British Association Committees had ceased to exist, that on coast erosion, and that on the circulation of underground waters, on account of the admirable way in which their work had been taken up by the local societies.

His Honour Deemster Gill said that the subject of coast erosion had been taken up by a Committee of the Legislature of the Isle of Man, but their investigations were not yet complete. They had found that for some twenty miles on the west, the north-west and the north, there had been a destruction of land of about twenty acres to the mile within the last fifty or sixty years. The meteorology of the Isle of Man was also being well looked after.

Mr. Sowerbutts asked whether it was desirable that the Manchester Geographical Society should collect the results of observations at their local observatories, and forward them to the Meteorological Society; and the Chairman replied in the affirmative.

Capt. Elwes hoped that local societies might be induced to co-operate for the discovery of flint implements, and the formulation of the results attained.

Mr. Osmund W. Jeffs, Secretary to the British Association Committee for the collection and Preservation of geological Photographs, said that the photographs collected would be placed in the Museum of Practical Geology, Jermyn Street, London. The first part of the collection, 800 photographs, had already been placed there. It was proposed to go on collecting, as many parts of the British Isles were quite unrepresented.

Mr. De Rance thought that it would be a good thing if each society would issue a circular and send it to other local societies, so that it might be known what photographs had been taken in each locality.

Mr. J. B. Murdoch (Glasgow) thought that in too many of their investigations Scotland was excluded. He mentioned, as an instance, the British Association Committee for recording the position, &c., of erratic blocks of England, Wales and Ireland.

Some discussion arose on this point, in which Mr. De Rance, Mr. Sowerbutts and Mr. G. P. Hughes took part. Then the Chairman said that he believed Scotland had been omitted in that instance because the Royal Society of Edinburgh had been working at the subject before the formation of the British Association Committee.

Mr. Murdoch replied that it was true that a Boulder Committee had existed in Scotland, but its director, Mr. Milne Holme, was dead, and had been unable to get about the country for some time before his death. The eight yearly reports issued by his Committee were very valuable, but for some time the work had been practically at a standstill.

The Chairman remarked that in that case it was most desirable that Scotland should be included by the Erratic Blocks Committee.

Deemster Gill said that the boulders of the Isle of Man were being noted by the Isle of Man Natural History and Antiquarian Society.

Prof. Meldola moved, and Mr. Hopkinson seconded, a motion in favour of an application to the General Committee for a grant of £30 to enable the Corresponding Societies Committee to carry on its work. This was carried, and the meeting ended.

At the second meeting, on Tuesday, September 17, the Corresponding Societies Committee was represented by Dr. Garson (in the chair), Mr. Hopkinson, Mr. Symons, and Mr. T. V. Holmes (Secretary).

The Chairman said that it was usual at their second meeting to consider the recommendations from the various Sections respecting work in which it was thought the Corresponding Societies might usefully co-operate.

Section A.

Mr. White Wallis, representing Section A, said that the Committees for investigating earth tremors and seismological phenomena in Japan had been merged into one, with the title of "Committee for Seismological Observations." The Committee for the application of photography to meteorology had been reappointed, and so had the Underground Temperature Committee. The Meteorological Photographs Committee was simply desirous to obtain photographs of lightning, rainbows, halos, &c.

The Rev. J. O. Bevan inquired whether the meteorological work formerly carried on at Stonyhurst by Father Perry was still going on. Mr. Sowerbutts answered that it was, and Mr. White Wallis said that he would note the suggestion that they should communicate with Stonyhurst. He added, in answer to questions, that instruments for noting earth tremors were unaffected by vibrations from passing waggons, trains, &c.